

REMARKS

The Official Action mailed December 18, 2002 has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, Applicant respectfully submits that this response is being timely filed.

Applicant notes with appreciation the consideration of the Information Disclosure Statement filed on August 28, 2001.

Claims 1-7 and 13-34 were pending in the present application. Claims 13-34 are restricted by the Examiner and withdrawn from consideration. By the present Amendment, claims 4 and 13-34 are canceled, and new claims 35-61 have been added to recite additional protection to which Applicant is entitled. Accordingly, claims 1-3, 5-7 and 35-61 are now pending in the present application, of which claims 1, 35, 42, 47, 54 and 58 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance.

The Applicant has amended claims 2, 3 and 5-7 to clarify the subject matter of the present invention. The amendments are merely clarifying in nature, and should not in any way affect the scope of protection afforded the claims for infringement purposes, particularly under the Doctrine of Equivalents.

Paragraph 3 of the Official Action rejects claim 1 under 35 U.S.C. § 112, second paragraph, as indefinite. Specifically, the Official Action indicates uncertainty with respect to the feature "wherein source and drain regions formed in said active layer contain said catalyst element than other regions in said active layer." In response, the Applicant has amended claim 1 to recite "wherein a concentration of said crystallization promoting material in a source region and a drain region formed in said active layer is higher than a concentration of said crystallization promoting material in other regions in said active layer by two or more orders of magnitude." The Applicant respectfully submits that claim 1, as amended, is definite.

Paragraph 5 of the Official Action rejects claims 1-7 as obvious based on the combination of U.S. Patent No. 5,550,070 to Funai et al. and U.S. Patent No. 5,459,090 to Yamazaki et al. The Applicant respectfully submits that a *prima facie* case of

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obviousness cannot be maintained against the independent claims of the present invention, as amended.

As stated in MPEP §§ 2143-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. The Applicant has amended claim 1 to incorporate the features of dependent claim 4, which recites that a concentration of a crystallization promoting material in a source region and a drain region of an active layer is higher than a concentration of the crystallization promoting material in other regions of the active layer by two or more orders of magnitude. These features are not taught or suggested by Funai and Yamazaki '090, either alone or in combination.

The Official Action concedes that Funai does not disclose "concentrations of the regions varying by two or more orders of magnitude" (p. 4, Paper No. 7). The Official Action asserts that "it would have been obvious ... to optimize this concentration difference, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges involves only routine skill in the art" (*Id.*). However, as set forth in MPEP § 2144.05, "[a] particular parameter

must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). In the present case, the Applicant respectfully submits that the Official Action has failed to sufficiently show that one of skill in the art would have recognized that the concentration of a crystallization promoting material in a source region and a drain region of an active layer as compared to a concentration of the crystallization promoting material in other regions of the active layer is a result-effective variable.

Furthermore, the Federal Circuit reversed a rejection based on inherency which was based on what would result due to optimization of conditions, not what was necessarily present in the prior art. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

Since Funai and Yamazaki '090 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. For the reasons stated above, the Official Action has not formed a *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejection of claims 1-3 and 5-7 under 35 U.S.C. § 103(a) is in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 1-3 and 5-7 as follows:

1. (Amended) A semiconductor device comprising:

an active layer comprising a semiconductor film comprising silicon, said active layer containing a [catalytic element] crystallization promoting material for promoting crystallization of said semiconductor film; and

a gate electrode comprising a heat-resistant material adjacent to said active layer with a gate insulating film interposed therebetween,

wherein a concentration of said crystallization promoting material in a source region and a drain [regions] region formed in said active layer [contain said catalyst element] is higher than a concentration of said crystallization promoting material in other regions in said active layer by two or more orders of magnitude.

2. (Amended) The semiconductor device according to claim 1, wherein said heat-resistant material is one of tantalum [or] and a material mainly comprising tantalum.

3. (Amended) The semiconductor device according to claim 1, wherein said [catalytic element] crystallization promoting material is nickel.

5. (Amended) The semiconductor device according to claim 1, wherein [concentration of said catalytic element in a channel region of said active layer is less than 5×10^{16} atoms/cm³] said semiconductor device is one selected from the group consisting of a portable intelligent terminal, a head mounted display, a front-projection type liquid crystal display, a cellular mobile telephone, a portable video camera, and a rear-projection liquid crystal display.

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6. (Amended) The semiconductor device according to claim 1, wherein said [catalytic element] crystallization promoting material is selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

7. (Amended) The semiconductor device according to claim 1, wherein said gate electrode has a heat-resistance to a heat treatment of [550-] 700°C.